POWER PROTECTION

Liebert®

PowerSure™ Interactive

700-2200 VA
230 V

USER MANUAL

English

IMPORTANT SAFETY INSTRUCTIONS

WARNING: Do not attempt to service this product yourself except to replace the battery. Opening or removing the cover may expose you to dangerous voltages, even when the AC cord is disconnected from the electrical outlet. Refer all servicing to qualified service personnel.

1. **SAVE THESE INSTRUCTIONS. THIS MANUAL CONTAINS IMPORTANT SAFETY INSTRUCTIONS.** Read all safety and operating instructions before operating the Uninterruptible Power System (UPS). Adhere to all warnings on the unit and in this manual. Follow all operating and user instructions.
2. This product is designed for Commercial/Industrial use only. It is not intended for use with life support and other designated "critical" devices. Maximum load must not exceed that shown on the UPS rating label. If uncertain, consult your dealer. See Limited Warranty.
3. When replacing the batteries, use the appropriate Liebert-Approved Replacement Battery Kit. Proper disposal of batteries is required. Refer to your local laws and regulations for disposal requirements.
4. Always turn off the UPS and unplug it before starting the battery replacement procedure. To replace batteries, refer to the battery replacement procedure. If you feel unqualified to replace the batteries, do not open the battery door. Refer all servicing to qualified service personnel.
5. **CAUTION:** Do not open or mutilate the batteries. Released electrolyte is harmful to skin and eyes and may be toxic.
6. The mains supply socket or means of isolation must be within 2 metres of the equipment and accessible to the operator. The UPS is designed for data processing equipment.
7. The UPS comes with two output power leads with moulded connectors. Do not modify the output power leads. Consult dealer if connector does not match the load socket. UPS must be earthed at all times while in use. Turn UPS off before unplugging it, or the safety earth will be removed.
8. The PowerSure Interactive models 700 VA, 1000 VA, and 1400 VA are not supplied with an input power lead for connection to the mains supply socket. Use the input mains supply power lead from your data processing equipment to connect the UPS to the mains supply. For the 2200 VA model, use the supplied 16 ampere rated input mains supply leads. For UK supply systems, consult a qualified electrician to connect the lead supplied for the 2200 VA model to the mains supply. Note caution on following page.

CAUTION: The UPS and connected load total earth leakage current must not exceed 3.5 milliamperes. If the connected load earth leakage current is likely to exceed 2.5 milliamperes or you are unsure, then convert the input lead attachment to either a fixed wiring installation or an industrial plug/socket (e.g. CEE 17 connector). This task should be carried out by a competent electrical engineer who is conversant with local electrical codes/regulations.

9. The UPS output supply sockets may be electrically live whenever the input power lead is plugged into the mains supply socket. Turning the UPS OFF does not electrically isolate the internal parts. To isolate the UPS, turn the UPS OFF then isolate it from the mains supply.
10. When installing the UPS or making input and output connections, comply with relevant safety standards (e.g. IEC950, VDE0805, EN50091-1).
11. This equipment complies with the requirements of the EMC Directive 89/336/EEC and the published technical standards. Continued compliance requires installation in accordance with these instructions and the use of manufacturer approved accessories with output cables not exceeding 10 metres (30 ft.) in length. Use a shielded cable for the external communications interface.
12. Operate UPS only from a properly earthed, 50 Hz or 60 Hz, 220-240 VAC mains supply. Models are available for 100-127 VAC supply voltages.
13. Route power supply leads so they are not walked on or pinched.
14. Never block or insert any object into the ventilation holes or other openings. Maintain a minimum clearance of 100 mm (4 inches) all around the UPS for proper air flow and cooling.
15. Operate the UPS in an indoor environment only, with an ambient temperature range of 0° C to +40° C (32° F to +104° F). Install it in a clean environment, free from moisture, flammable liquids, gasses, or corrosive substances.
16. Storing magnetic media on top of the UPS may result in data loss or corruption.
17. Turn the UPS off and unplug the UPS before cleaning. Use only a soft cloth, never liquid or aerosol cleaners.
18. This equipment can be operated by individuals without previous training.

INTRODUCTION & SYSTEM DESCRIPTION

Congratulations on your choice of the Liebert PowerSure™ Interactive Uninterruptible Power System (UPS). It provides conditioned power to microcomputers and other sensitive electronic equipment.

Upon generation, AC power is clean and stable. However, during transmission it may be subject to voltage sags, spikes, or complete power failure which may interrupt computer operations, cause data loss, or even damage equipment. The PowerSure™ Interactive protects equipment from these disturbances.

The PowerSure™ Interactive comes in nominal power ratings of 700, 1000, 1400, or 2200 VA. Complete specifications appear near the end of this section.

The PowerSure™ Interactive is a compact, “line interactive” UPS. A “line interactive” UPS continuously conditions and regulates its output voltage, whether the mains power is present or not. It supplies connected equipment with clean sinewave power, to simulate as much as possible, the power generated by the mains. Sensitive electronic equipment operates best from sinewave power.

For ease of use, the PowerSure™ Interactive contains a light emitting diode (LED) bar display to indicate either “load percentage” or “battery capacity” depending upon the mode of operation. It also provides self diagnostics, a combination alarm silence/battery test button, and two levels of alarms when the unit is operating on battery.

The PowerSure™ Interactive has an interface port for communications between the UPS and a LAN server or other computer system. This port provides detailed operating information including voltages, currents, and alarm status to the host system when used in conjunction with Liebert SiteNet® software. SiteNet® software can also remotely control UPS operation.

GLOSSARY OF SYMBOLS

Indicates AC Input

Indicates AC Output

Indicates Caution: Note the accompanying instruction

Indicates the position of a fuse

Requests the user to consult the manual for additional information

Indicates that the unit contains a valve regulated lead acid battery

MAJOR COMPONENTS

TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) AND EMI/RFI FILTERS

These UPS components provide surge protection and filter electromagnetic interference (EMI) and radio frequency interference (RFI). They minimize any surges or interference present in the mains line and keep the sensitive equipment protected.

AUTOMATIC VOLTAGE REGULATOR

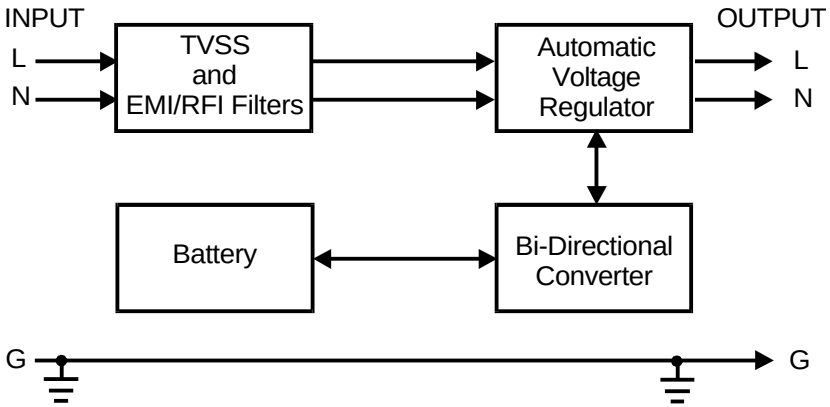
In normal operation, the automatic voltage regulator (AVR) passes mains AC power to the connected load. When mains power voltage is outside acceptable limits, the AVR activates. It raises undervoltage power and lowers overvoltage power. This keeps the UPS output voltage within the connected equipment's tolerances and allows wide mains voltage fluctuations without utilizing battery power.

BI-DIRECTIONAL CONVERTER

In normal operation, the bi-directional converter "converts" mains AC power into regulated DC power to "float" charge the battery system. Upon a mains power failure, the bi-directional converter receives its required energy from the battery and "inverts" it into precise, regulated sinewave AC power. Charging takes place whenever the UPS is plugged into the wall outlet and mains power is within acceptable limits.

BATTERY

The PowerSure™ Interactive utilizes valve regulated, nonspillable, lead acid batteries. At typical room temperatures and with the UPS float charging, the battery system will last many years. For battery run times, refer to the Typical Battery Discharge Curves.



MINI-TOWER INSTALLATION

1. Unpack the UPS carefully noting the packing method. Retain the box and packing material for possible future shipment.

   CAUTION: The UPS is heavy (see specifications). Take proper precautions when lifting or moving it.

2. Visually inspect the UPS for freight damage. Report damage to the carrier and your dealer.

3. Locate the UPS where it cannot be accidentally disconnected. Locate it in an area with unrestricted air flow, away from water, flammable liquids, gases, or corrosives. Maintain a minimum of 100 mm (4 inches) clearance around the UPS. Maintain an ambient temperature range of 0° to 40° C (32° to 104° F).

   NOTE: UPS operation in temperatures above 25° C (77° F) reduces battery life.

4. Shutdown load equipment, turn off mains supply, and unplug load equipment's power input cable (A) from mains supply socket.

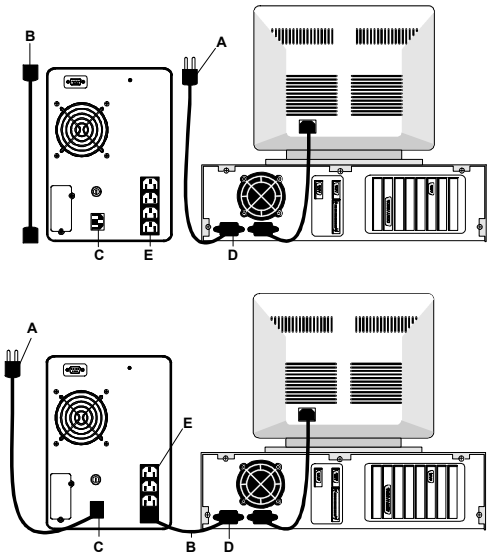
5. **700-1400 VA models**: unplug power input cable (A) from load equipment input socket (D) and plug it into UPS input socket (C). Re-plug the power input cable (A) into mains supply socket. Proceed with step 9.
   2200 VA models: an input cable is not supplied. Proceed with the next step after obtaining a proper cable with an IEC 320-16 receptacle.

6. Connect the molded connector of the mains AC input supply cable into the UPS.

7. Fit the supplied retainer bracket around the input supply cable and secure the bracket to the rear of the UPS using the two supplied screws. (See figure on next page).

8. The free end of the input supply cable should be connected to the electrical supply distribution system in accordance with local rules and conditions.

   NOTE: The UPS On / Alarm Silence and Manual Battery Test buttons do not electrically isolate the internal parts. To isolate the UPS, provide an isolator that is accessible to the operator and located within two meters of the UPS.



The wires in the mains lead are colored with the following code:

Green and Yellow = Earth
Blue = Neutral
Brown = Live

As the color of the wires in the mains lead may not correspond with the colored marking identifying the terminals in the plug, proceed as follows:

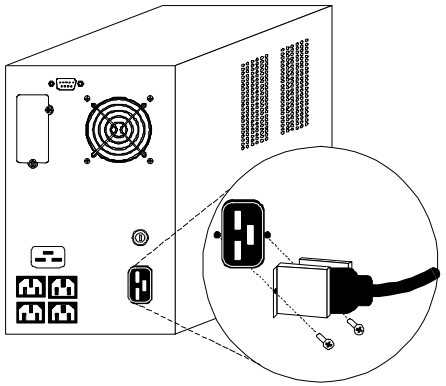
The green and yellow wire must be connected to the terminal in the plug which is marked with the letter “E” or by the earth symbol, or colored green and yellow.

The blue wire must be connected to the terminal which is marked with the letter “N” or colored black.

The brown wire must be connected to the terminal which is marked with the letter “L” or colored red.

9. Connect the supplied IEC320-10 output cable (B) between the load equipment input socket (D) and one of the UPS AC output sockets (E). Connect all load equipment to the UPS in this way.

10. Turn on the UPS by pressing the On button for at least one half second; then turn on the connected load equipment. The UPS is ready for normal operation.



RACKMOUNT INSTALLATION

1. Unpack the UPS carefully noting the packing method. Retain box and packing material for possible future shipment.

   CAUTION: The UPS is heavy (see specifications). Take the proper precautions when lifting or moving the UPS.

2. Visually inspect the UPS for freight damage. Report any damage to the carrier and your dealer.

3. Locate the UPS indoors where it cannot be accidentally disconnected. Locate it in an area with unrestricted air flow, away from water, flammable liquids, gases, or corrosives. Maintain a minimum of 100 mm (4 inches) clearance around the UPS. Maintain an ambient temperature range of 0° to 40° C (32° to 104° F).
   NOTE: UPS operation in temperatures above 77° F (25° C) reduces battery life.

4. Gently lay UPS on its bottom side so that the front bezel is facing you.

5. The Rackmount UPS must be supported by a shelf or rails. The front bezel will not support the weight of the UPS.

   CAUTION: To Increase the stability of the rack enclosure, place the UPS in the lowest possible rack position).

6. Refer to the Installation instructions supplied with the Rack Slide or Shelf Kits to complete the installation procedures.

7. **700-1400 VA models**: unplug power input cable (A) from load equipment input socket (D) and plug it into UPS input socket (C). Re-plug the power input cable (A) into mains supply socket. Proceed with step 13.
   2200 VA models: an input cable is not supplied. Proceed with the next step after obtaining a proper cable with an IEC 320-16 receptacle.

8. Connect the molded connector of the mains AC input supply cable into the UPS.

9. Fit the supplied retainer bracket around the input supply cable and secure the bracket to the rear of the UPS using the two supplied screws (see figure on next page).

10. Ensuring load equipment is turned off, plug all loads into the UPS output receptacles.

11. The free end of the input supply cable should be connected to the electrical supply distribution system in accordance with local rules and conditions.
    NOTE: The UPS On/Alarm Silence and Manual Battery Test buttons do not electrically isolate the internal parts. To isolate the UPS, provide an isolator that is accessible to the operator and located within two meters of the UPS.

12. The wires in the mains lead are colored with the following code:
    Green and Yellow = Earth
    Blue = Neutral
    Brown = Live

    As the color of the wires in the mains lead may not correspond with the colored marking identifying the terminals in the plug, proceed as follows:

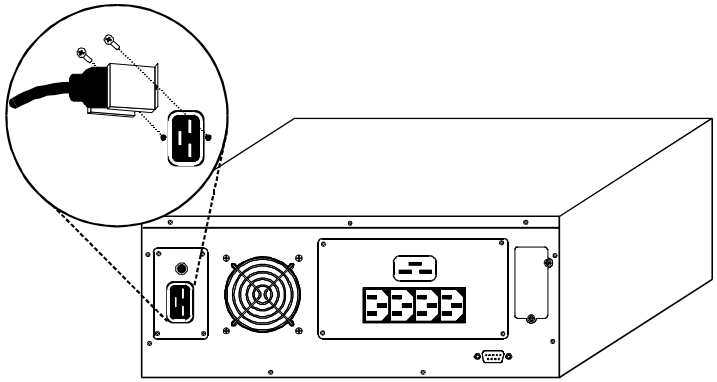
    The green and yellow wire must be connected to the terminal in the plug which is marked with the letter “E” or by the earth symbol, or colored green and yellow.

The blue wire must be connected to the terminal which is marked with the letter "N" or colored black.

The brown wire must be connected to the terminal which is marked with the letter "L" or colored red.

13. Connect the supplied IEC 320-10 output cable (B) between the load equipment input socket (D) and one of the UPS AC output sockets (E). Connect all load equipment to the UPS in this way.

14. Turn on the UPS, by pressing the On/Off button, then turn on the connected load equipment. The UPS is ready for normal operation.



CONTROLS AND INDICATORS

On/Off Button

The On/Off button controls output power to connected load(s).

CAUTION: Pressing the On/Off button when AC mains is not present will cause the UPS to begin operating from battery. This should not be performed unless the UPS input is connected to a properly earthed socket.

Load/Battery Level Indicators (ALL GREEN)

The Load/Battery Level Indicators have dual functions. During normal mode operation, LED indicators display electrical load placed upon the UPS; and during battery mode operation, LED indicators display battery capacity remaining. Each LED designates a 25% load or battery capacity increment. All four LED indicators illuminate at full load/battery capacity. If the UPS becomes loaded beyond full rating, the top LED indicator will flash continuously while an alarm sounds.

Mains/Battery Status Indicator (GREEN)

An illuminated LED indicates the power button is on and mains power is available. A flashing LED along with an alarm signifies mains voltage is out of specification and UPS is operating in battery mode.

Mains High/Low Indicator (AMBER)

An illuminated LED indicates the UPS is correcting mains power, due to a mains overvoltage or undervoltage condition.

Fault Indicator (GREEN)

The Fault indicator is the second uppermost LED (contained in load/battery level indicators). A flashing LED indicates the UPS has detected a problem. An alarm sounds to alert that the UPS requires attention. Refer to Troubleshooting Guide.

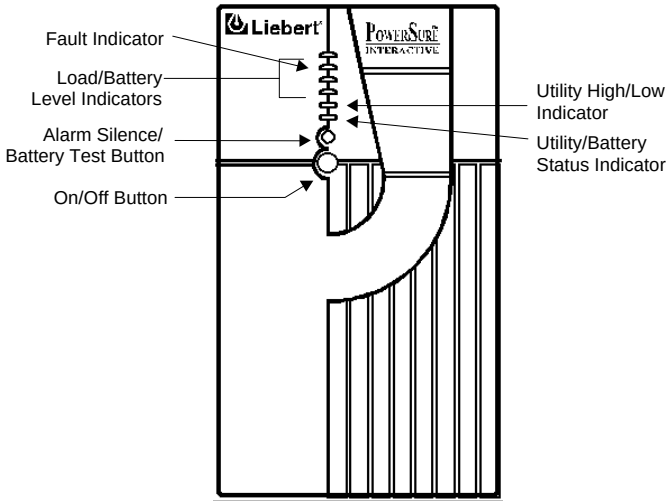
Alarm Silence/Battery Test Button

The Alarm Silence/Battery Test button serves a dual purpose. During normal mode operation, press button for at least one half second to test capacity of the battery system. The UPS will operate in battery mode for approximately 15 seconds. The illuminated LED indicators in Load/Battery Level determine battery mode capacity in 25% increments.

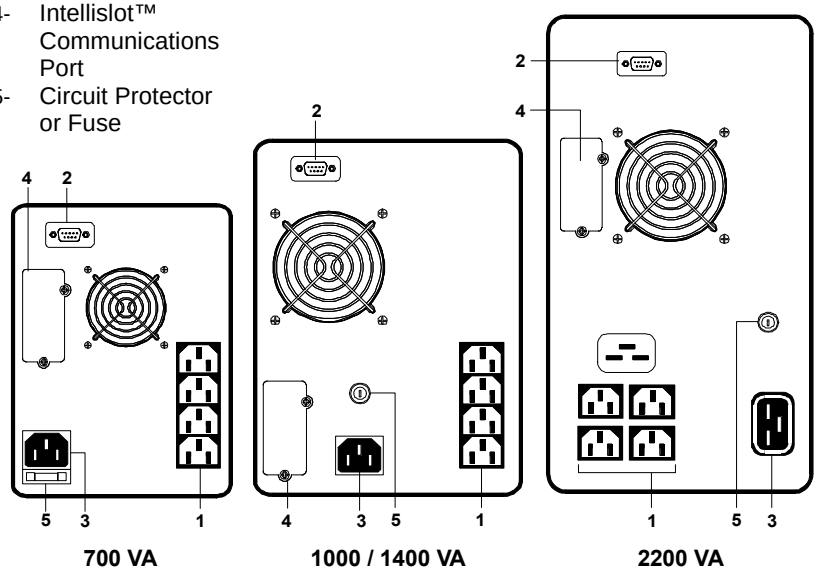
During battery mode operation or active alarm condition, this button functions as the alarm silence feature. Pressing this button for at least one half second will silence the alarm. After the alarm is silenced, the PowerSure™ Interactive will reactivate the alarm system to alert of additional problems. The low battery alarm is the single alarm that cannot be silenced.

During a Battery Test, if the top two LEDs do not illuminate allow the UPS to recharge the batteries for 24 hours. After 24 hours, retest the batteries. If the batteries have been retested and the top two LEDs still do not illuminate, contact your dealer or Liebert Technical Support (LTS) for a battery replacement kit.

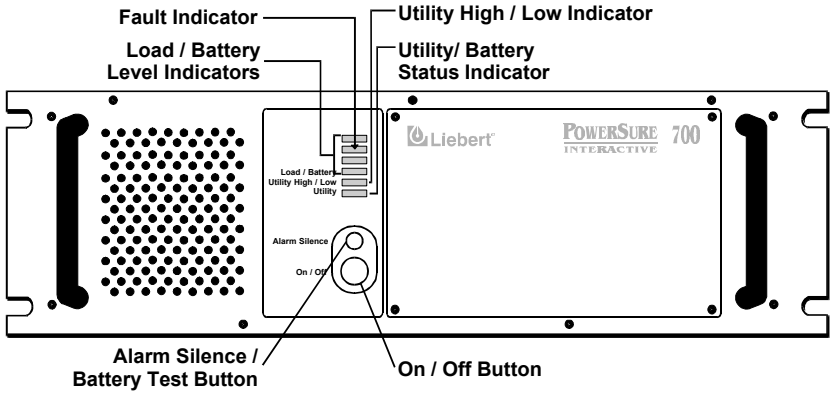
MINI-TOWER POWERSURE™ INTERACTIVE



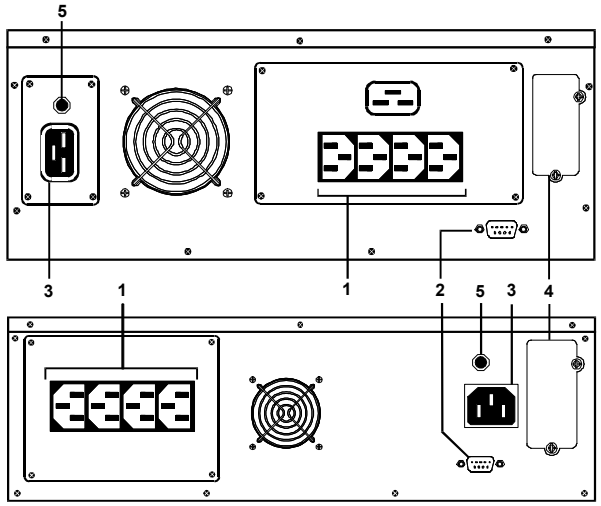
1- Output Receptacles
2- DB-9 Interface Port
3- AC Inlet
4- Intellislot™ Communications Port
5- Circuit Protector or Fuse



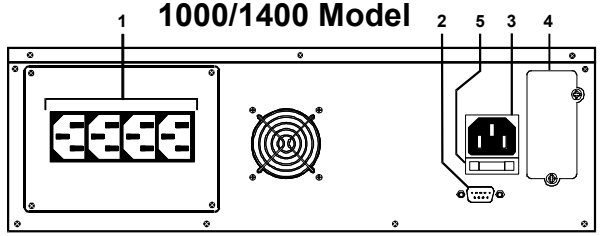
RACKMOUNT POWERSURE™ INTERACTIVE



2200 Model



1000/1400 Model



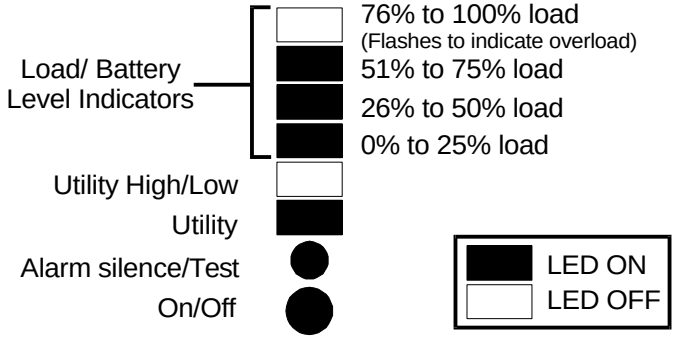
700 Model

1- Output Receptacles
2- DB-9 Interface Port
3- AC Inlet
4- Intellislot™ Communications Port
5- Circuit Protector or Fuse

OPERATION

NORMAL MODE OPERATION

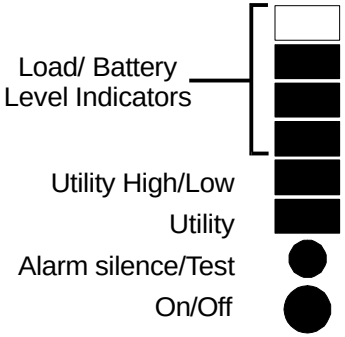
During normal operation, mains power provides energy to the UPS. The filters and the power conditioning circuit process this power to provide computer grade power to connected loads. The UPS maintains the batteries in a fully charged state.
The front panel displays the percentage of load on the UPS output. The figure below indicates approximately 51-75% loading.



MAINS HIGH/LOW MODE OPERATION

If high or low voltage conditions occur, the PowerSure™ Interactive UPS will automatically correct the mains voltage by either lowering or raising the input voltage condition. The UPS will continue to correct these conditions indefinitely, without draining battery power.

The figure below indicates approximately 51-75% loading while automatically correcting the mains voltage.



BATTERY MODE OPERATION

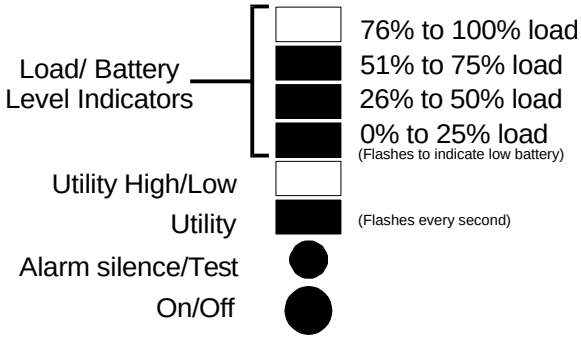
Battery mode occurs in event of extreme input voltage condition or complete mains failure. The battery system along with the bi-directional converter generates power for the connected load.

During battery mode an alarm sounds every 10 seconds. This will change to 2 beeps every 5 seconds when battery runs low (approximately 2 minutes remaining). Each load/battery level indicator represents a 25% capacity level. As capacity decreases, fewer indicators remain illuminated. Mains LED will flash every second indicating the UPS is operating from battery mode.

Battery mode supports a full rated load for approximately 5 minutes before it shuts down. To increase this time, turn off non essential pieces of equipment (such as idle computers and monitors).

WARNING: Turning off the UPS while in battery mode will result in loss of output power.

The figure below displays approximately 51-75% battery capacity remaining.



BATTERY RECHARGE MODE

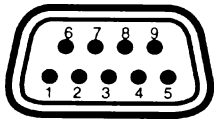
The UPS resumes normal operation once mains power is restored, whether the UPS is ON or OFF. At this time, the bi-directional converter begins recharging the battery.

COMMUNICATIONS INTERFACE PORT

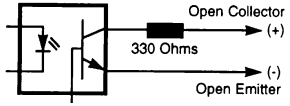
The PowerSure™ Interactive UPS contains a standard DB-9 receptacle located on the rear of the UPS unit. Several signals are provided on this port and are assigned as follows:

PIN	ASSIGNMENT DESCRIPTION
1	Low Battery (open collector)
2	UPS TxD (typical RS-232 levels)
3	UPS RxD (typical RS-232 levels)
4	Remote Shutdown (5-12V DC, 1.0 mA. max.); battery operation
5	Common
6	No connection
7	Low Battery (open emitter)
8	Mains Fail (open emitter)
9	Mains Fail (open collector)

Pin Assignment



Collector to Emitter*



*Maximum voltage and current on pins 1, 7, 8, 9 is 80V DC; 10.0 mA.

UPS MONITORING

The PowerSure™ Interactive UPS has the capability of being monitored with stand alone computers, network workstations, network servers, or UNIX hosts via the DB-9 receptacle located on the rear of the UPS.

This capability is used in applications requiring the UPS to provide status and power monitoring information to the computer system. For example, during a mains power failure, the information can be used by the computer's operating system or application program to automatically save information in buffers, to close files, and shut down operations prior to battery capacity depletion.

Monitoring of the UPS via a computer system is easily made with a Liebert SiteNet® 1 shutdown kit (sold separately). Consult your local Liebert representative to determine the correct software kit for your application. The kit includes special purpose cable and shutdown software.

UPS INTELLIGENT COMMUNICATIONS

The PowerSure™ Interactive UPS has the capability to communicate intelligently with stand alone computers, network workstations, network servers, or UNIX hosts via the DB-9 receptacle located on the rear of the UPS. By purchasing the optional Liebert SiteNet® 2 software package (sold separately), intelligent communications allows the following capabilities:

- Quantitative monitoring of mains and UPS power
- Quantitative monitoring of internal UPS parameters
- Periodic tests of battery quality and replacement notification
- Timed and delayed shutdown of the UPS
- Logging of power disturbances and anomalies

Consult your local Liebert sales representative for more information about SiteNet® 2 software.

UPS INTELLISLOT™ COMMUNICATIONS

The PowerSure™ Interactive UPS contains an Intellislot™ communications port for the optional internal Ethernet SNMP card. Optional SiteNet® SNMP Manager software is available to allow communication through several network management systems. Contact your local Liebert representative, dealer, or reseller.

CAUTION: TO MAINTAIN SAFETY (SELV) BARRIERS AND FOR ELECTROMAGNETIC COMPATIBILITY, SIGNAL CABLES SHOULD BE SEGREGATED AND RUN SEPARATELY FROM ALL OTHER POWER CABLES, WHERE APPLICABLE.

MAINTENANCE

The PowerSure™ Interactive UPS requires very little maintenance. The batteries are valve regulated, nonspillable, lead acid, and require that they be kept charged to obtain their designed life. The UPS continuously charges the batteries when connected to the mains supply.

When storing the UPS for any length of time, it is recommended to plug the UPS in for at least 24 hours every four to six months to ensure full recharge of the batteries.

The PowerSure™ Interactive UPS is designed to allow the user to safely replace the batteries. Read the safety cautions before proceeding. Contact your dealer to obtain the appropriate replacement battery kit.

MINI-TOWER BATTERY REPLACEMENT

CAUTION- A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed before replacing the batteries:

- Turn off and disconnect the UPS from utility power prior to opening the battery replacement door.
- Remove rings, watches, and other metal objects.
- Use a Phillips (cross head) screwdriver with insulated grips.
- Do not lay tools or other metal objects on top of the batteries.
- If the battery replacement kit is damaged in any way or shows signs of leakage, contact your dealer immediately.
- Do not dispose of batteries in a fire, the batteries may explode.
- If you feel unqualified to replace the battery, do not open the battery door. Call Liebert Technical Support (LTS). World Wide Technical Support numbers are located at the end of this section.

1. Grasp the front bezel near the top and pull forward.
2. Rotate the bezel upward and lay it on top of the UPS.
3. Loosen the (2) screws at top of the battery door and remove door by pulling it forward slightly and lifting it off. Lay battery door and screws aside for reassembly.
4. **700/1000/1400 VA models:** gently pull battery wiring out and disconnect the red wire (+) and black wire (-).
   2200 VA models: pull apart connectors A and B.
5. Grasp white pull-tabs located on sides of the front battery, and pull batteries out of the UPS.
6. Unpack new batteries taking care not to destroy the packing.
7. Slide new batteries into the cavity, noting the white pull-tabs are facing outward.
8. **700/1000/1400 VA models:** connect the battery wires; first red to red, then black to black.
   2200 VA models: first connect top battery connector A to bottom battery connector A; then connect UPS connector B to the top battery connector B.

   NOTE: There will be a small spark when connecting the black connectors on 700-1400 VA models, and connector B on the 2200 VA model. This is normal and will not harm you or the UPS.
9. Replace battery door by inserting the (2) metal tabs into the slots at the base of the UPS, and pushing it closed at the top. Tighten the (2) screws to lock the battery door closed.
10. Flip the bezel back into place, and align bottom clips to the lower slots in the battery door. Once aligned, push bezel back onto the UPS until it latches into position. This may require a gentle tap.
11. Recycle/Dispose of old batteries in accordance with your local laws and regulations.

Pull bezel forward

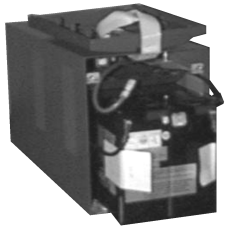
Rotate bezel on top

Remove battery door

700 VA Model

To Disconnect: Gently pull wiring away

To Connect: Connect red wire to red terminal, then black wire to black terminal by pushing towards connector



1000/1400 VA Model

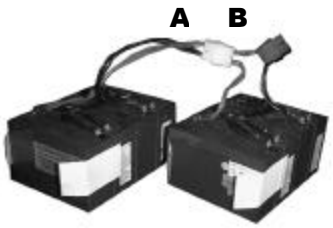
To Disconnect: Gently pull wiring away

To Connect: Connect red wire to red terminal, then black wire to black terminal by pushing upward

2200 VA Model

To Disconnect: Pull apart connections A & B

To Connect: Push connections A together & connections B together



RACKMOUNT BATTERY REPLACEMENT

CAUTION- A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed before replacing the batteries:

- Turn off and disconnect the UPS from utility power prior to opening the battery replacement door.
- Remove rings, watches, and other metal objects.
- Use a Phillips (cross head) screwdriver with insulated grips.
- Do not lay tools or other metal objects on top of the batteries.
- If the battery replacement kit is damaged in any way or shows signs of leakage, contact your dealer immediately.
- Do not dispose of batteries in a fire, the batteries may explode.

If you feel unqualified to replace the battery, do not open the battery door. Call Liebert Technical Support (LTS). World Wide Technical Support numbers are located at the end of this section.

1. Using a Phillips (cross head) screwdriver loosen the (4) screws around the battery door as in Figure 1. Carefully remove the battery door by pulling it forward. Lay the battery door and screws aside for reassembly.
2. Again using a Phillips (cross head) screwdriver loosen the (4) screws holding the battery retaining plate as in Figure 2. Carefully remove the battery retaining plate by pulling it forward. Lay the battery retaining plate and screws aside for reassembly.
3. **700/1000/1400 VA models:** Gently pull on the white tabs located on both sides of the battery until wiring is exposed (Figure 3). Disconnect red wire (+) (figure 4) and the black wire (-) (figure 5).
   2200 VA model: Pull apart the Battery harness connector (Figure 6 & 7). Remove batteries.
4. Unpack new batteries taking care not to destroy the packing material.
5. Slide new batteries into the cavity, noting the white pull-tabs are facing outward.
6. **700/1000/1400 VA models:** Connect the battery wires; first black to black, then red to red. **2200 VA models:** Connect the battery harness connector. Push batteries back into cavity.

   NOTE: There will be a small spark when connecting the Red to Red connectors on 700-1400 VA models, and on the 2200 VA model when connecting the battery harness connector. This is normal and will not harm you or the UPS.
7. Replace the Battery retaining plate by inserting the (4) screws into their associated holes. Tighten the (4) screws to secure the battery retaining plate in place.
8. Replace the Battery door by inserting the four (4) screws into their associated holes. Tighten the four (4) screws to secure the battery door in place.
9. Recycle/Dispose of old batteries in accordance with your local laws and regulations.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

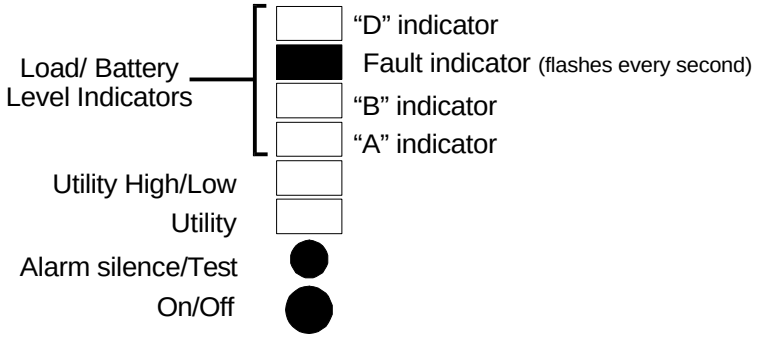
Figure 6

Figure 7

TROUBLESHOOTING

The information below indicates various symptoms a user may encounter in the event the PowerSure™ Interactive UPS develops a problem. Use this information to determine whether external factors cause the problem and how to remedy the situation.

1. The fault indicator will flash every second to indicate the UPS detected a problem.
2. An alarm will sound, alerting that the UPS requires attention.
3. One or more additional load/battery level LED segments will be illuminated to provide a diagnostic aid to the operator, as described below:



A. UPS fault (fan failure, battery overcharge)
NOTE: The internal fan operates intermittently as needed
B. UPS failed battery test
D. UPS shutdown due to output overload time-out
A&B. UPS shutdown due to main input relay failure/output short circuit
A&D. UPS shutdown due to over temperature condition
B&D. UPS shutdown due to command from communication ports (remote shutdown or SNMP)

The fault indicators will be illuminated indefinitely while battery charger is operational, or for a maximum of 5 minutes while battery charger is not operational.

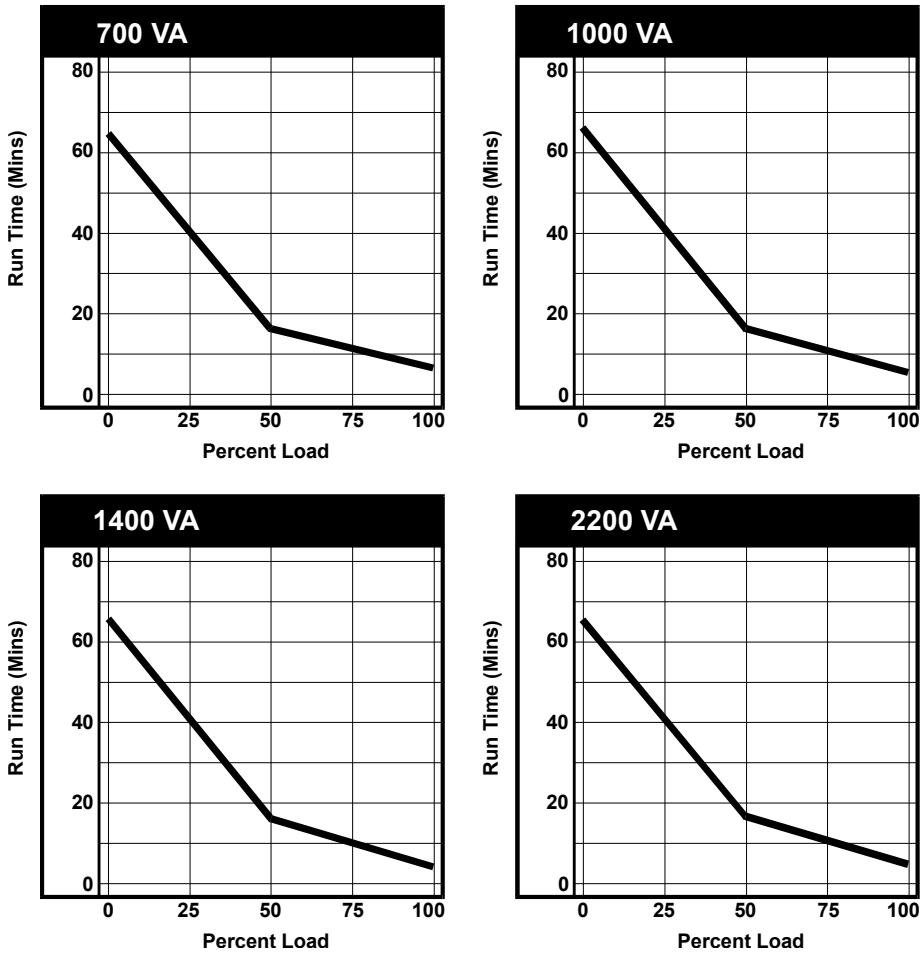
If a problem persists consult your dealer, or contact Liebert Technical Support (LTS). World Wide Technical Support numbers are located at the end of this section.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
UPS fails to start when On/Off button is pressed	UPS output short circuited or overloaded.	Ensure UPS is off. Disconnect all loads and ensure nothing is lodged in output receptacles. Ensure loads are not defective or shorted internally.
	Internal fuse is blown, indicating internal fault.	Do not attempt to open or service the UPS. Contact your dealer or LTS.
Mains indicator flashing	UPS not plugged in.	UPS is operating in battery mode, make certain UPS is securely plugged into the wall receptacle.
	UPS input protection has opened.	UPS is operating in battery mode. Save data and close applications. Replace UPS input fuse or reset input breaker, then restart UPS .
	Mains voltage out of UPS input range.	UPS is operating in battery mode. Save data and close applications. Ensure mains supply voltage is within acceptable limits for UPS.
UPS has reduced battery time	Batteries not charged.	Keep UPS plugged in continuously at least 24 hours to recharge batteries.
	UPS is overloaded.	Check load level display and remove non essential loads.
	Batteries may not be able to hold a full charge due to age.	Replace batteries. Contact your dealer or LTS for replacement battery kit.
"Fault" indicator and diagnostic LED "A" are illuminated	UPS fan failure or battery overcharge.	UPS requires service. Contact your dealer or LTS.
"Fault" indicator and diagnostic LED "B" are illuminated	UPS failed the battery test.	Replace batteries. Contact your dealer or LTS for replacement battery kit.
UPS shut down. "Fault" indicator and diagnostic LED "D" are illuminated	UPS overloaded or load equipment is faulty.	Check load level display and remove non essential loads. Recalculate load VA and reduce number of loads connected to UPS. Check load equipment for faults.
UPS shuts down with the "Fault" indicator and diagnostic LEDs "A" & "B" are illuminated	UPS shutdown due to internal failure.	UPS requires service. Contact your dealer or LTS.
UPS shuts down with the "Fault" indicator and diagnostic LEDs "A" & "D" are illuminated	UPS shutdown due to an internal over temperature condition.	Ensure UPS is not overloaded, ventilation openings not blocked, or room ambient temperature not excessive. Wait 30 minutes to allow UPS to cool, then restart UPS. If it does not restart, contact your dealer or LTS.
UPS shuts down with the "Fault" indicator and diagnostic LEDs "B" & "D" are illuminated	UPS shutdown due to a command from the communications port(s).	Your UPS has received a signal or command from the attached computer. If this was inadvertent, ensure the communication cable used is correct for your system. For assistance, contact your dealer or LTS.

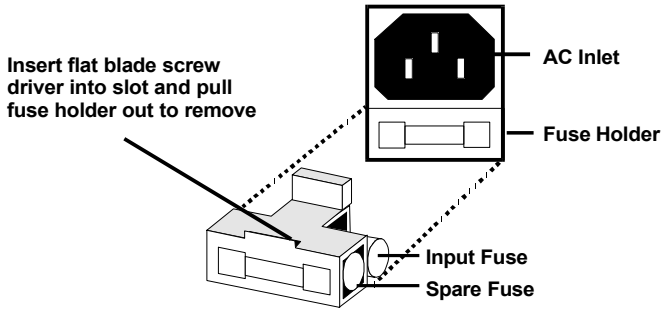
POWERSURE™ INTERACTIVE TYPICAL BATTERY DISCHARGE CURVES

(Discharge times are at 25° C ambient)



AUDIBLE ALARM CONDITIONS	
CONDITION	ALARM
Battery mode (mains failure)	One short beep every ten seconds; more than two minutes of run time remaining
Low battery	Two short beeps every five seconds; less than two minutes of run time remaining
Battery replacement	Two second beep every minute
UPS output overload	One short beep every second
UPS fault	Continuous tone

FUSE REPLACEMENT PROCEDURES FOR 700 VA MODELS



CAUTION: Before changing the supply fuse, turn off the UPS, and unplug the input cord from the AC input power supply and from the UPS.

1. Remove the fuse holder by inserting a flat blade screw driver into the slot and pulling out as indicated in the figure above.
2. Remove the input fuse.
3. Remove the spare fuse from its position by using the screw driver to push it out.
4. Place spare fuse in the input fuse position, and replace the fuse holder. The fuse holder will lock into position.
5. Reconnect the input power lead to the UPS, and the input power lead to the input AC supply.
6. Restart the UPS. The UPS is ready for normal operation.

NOTE: For 1000, 1400, and 2200 VA units press the reset circuit protector button.

MINI-TOWER SPECIFICATIONS

Model Number	PS700MT-230	PS1000MT-230	PS1400MT-230	PS2200MT-230
Model Rating VA/W	700 / 450	1000 / 670	1400 / 950	2200 / 1600
DIMENSIONS: mm (in)				
Unit W x D x H	140 x 365 x 178 (5.5 x 14.4 x 7.0)	172 x 447 x 227 (6.8 x 17.5 x 8.9)	172 x 447 x 227 (6.8 x 17.5 x 8.9)	194 x 511 x 336 (7.6 x 20.1 x 13.2)
Shipping W x D x H	265 x 492 x 300 (10.5x19.2x11.75)	307 x 581 x 358 (12.0 x 22.25 x 14)	307 x 581 x 358 (12.0 x 22.25 x 14)	330 x 635 x 470 (13.0 x 25.0 x 18.5)
WEIGHT: kg (lbs)				
Unit	13.6 (29.9)	19.7 (43.4)	22.5 (49.4)	37.1 (81.7)
Shipping	15.0 (33.1)	21.1 (46.5)	23.9 (52.5)	39.5 (87.0)
INPUT AC PARAMETERS				
Voltage Range	230 VAC; -27%, +18%			
Voltage Raise	Maintains output to 230 VAC; -19%, when input is 230 VAC, -27%			
Voltage Lower	Maintains output to 230 VAC; +8%, when input is 230 VAC, +18%			
Frequency	45-55 Hz or 55-65 Hz; auto sensing			
Input Connector	IEC 320-10A	IEC 320-10A	IEC 320-10A	IEC-320-16A
OUTPUT AC PARAMETERS				
Output Sockets	(4) IEC 320-10A	(4) IEC 320-10A	(4) IEC 320-10A	(4) IEC320-10A, (1) IEC-320-16A
Voltage	186 VAC to 248 VAC			
Max. Current Rating	3.0 A	4.3 A	6.1 A	9.6 A
Frequency	50 Hz or 60 Hz			
Waveform	Sinewave			
Mains Mode Overload	200% for > 2 cycles; 110% for > 5 minutes			
Battery Mode Overload	150% for > 1 cycle; 110% for > 30 seconds			
BATTERY PARAMETERS				
Type	Valve-regulated, nonspillable, lead acid			
Qty. x Voltage x Rating	2 x 12V x 7.0 or 7.2 AH	3 x 12V x 7.0 or 7.2 AH	4 x 12V x 7.0 or 7.2 AH	8 x 6V x 12 AH
Batt. Mfg./ Part Number	CSB: GP1270F2 or Panasonic LC-R127R2CH1			Panasonic: LC-R0612CH1
Transfer Time	2-6 ms typical, includes detect and transfer			
Back-up Time	See Typical Battery Discharge Curves			
Recharge Time	3 Hours to 95% capacity, after full discharge into 100% load			
ENVIRONMENTAL				
Operating Temperature	0° C to +40° C (+32° F to + 104° F)			
Storage Temperature	-15° C to +50° C (+5° F to + 122° F)			
Relative Humidity	0% to 95%, non-condensing			
Operating Elevation	Up to 10,000 ft. (3000 m) at 35° C without derating			
Storage Elevation	15,000 m (50,000 ft.) maximum			
Audible Noise	<45 dBA at 1 meter			
AGENCY				
Safety	TUV/GS Listed, CE Low Voltage Directive compliant			
RFI/EMI	EN 55022, Class B; CE EMC Directive compliant			
Immunity	IEC 801-2, Level 4 / IEC 801-3, Level 3 / IEC 801-4, Level 4 / IEC 801-5, Level 3			

RACKMOUNT SPECIFICATIONS

Model Number	PS700RM-230	PS1000RM-230	PS1400RM-230	PS2200RM-230
Model Rating VA/W	700 / 450	1000 / 670	1400 / 950	2200 / 1600
DIMENSIONS: mm (in)				
Unit W x D x H	483 x 457 x 133 (19 x 18 x 5.25)	483 x 457 x 133 (19 x 18 x 5.25)	483 x 457 x 133 (19 x 18 x 5.25)	483 x 457 x 178 (19 x 18 x 7)
Shipping W x D x H	699 x 610 x 279 (27.5 x 24 x 11)	699 x 610 x 279 (27.5 x 24 x 11)	699 x 610 x 279 (27.5 x 24 x 11)	699 x 610 x 305 (27.5 x 24 x 12)
WEIGHT: kg (lbs)				
Unit	18.9 (41.5)	23.3 (51.3)	26.0 (57.2)	39.1 (86.0)
Shipping	23.1 (50.8)	27.2 (59.9)	30.0 (66.1)	43.3 (95.3)
INPUT AC PARAMETERS				
Voltage Range	230 VAC; -27%, +18%			
Voltage Raise	Maintains output to 230 VAC; -19%, when input is 230 VAC, -27%			
Voltage Lower	Maintains output to 230 VAC; +8%, when input is 230 VAC, +18%			
Frequency	45-55 Hz or 55-65 Hz; auto sensing			
Input Connector	IEC 320-10A	IEC 320-10A	IEC 320-10A	IEC-320-16A
OUTPUT AC PARAMETERS				
Output Sockets	(4) IEC 320-10A	(4) IEC 320-10A	(4) IEC 320-10A	(4) IEC320-10A, (1) IEC-320-16A
Voltage	186 VAC to 248 VAC			
Max. Current Rating	3.0 A	4.6 A	6.1 A	9.6 A
Frequency	50 Hz or 60 Hz			
Waveform	Sinewave			
Mains Mode Overload	200% for > 2 cycles; 110% for > 5 minutes			
Battery Mode Overload	150% for > 1 cycle; 110% for > 30 seconds			
BATTERY PARAMETERS				
Type	Valve-regulated, nonspillable, lead acid			
Qty. x Voltage x Rating	2 x 12V x 7.0 or 7.2 AH	3 x 12V x 7.0 or 7.2 AH	4 x 12V x 7.0 or 7.2 AH	8 x 6V x 12 AH
Batt. Mfg./ Part Number	CSB: GP1270F2 or Panasonic LC-R127R2CH1			Panasonic: LC-R0612CH1
Transfer Time	2-6 ms typical, includes detect and transfer			
Back-up Time	See Typical Battery Discharge Curves			
Recharge Time	3 Hours to 95% capacity, after full discharge into 100% load			
ENVIRONMENTAL				
Operating Temperature	0° C to +40° C (+32° F to + 104° F)			
Storage Temperature	-15° C to +50° C (+5° F to + 122° F)			
Relative Humidity	0% to 95%, non-condensing			
Operating Elevation	Up to 10,000 ft. (3000 m) at 35° C without derating			
Storage Elevation	15,000 m (50,000 ft.) maximum			
Audible Noise	<45 dBA at 1 meter			
AGENCY				
Safety	TUV/GS Listed, CE Low Voltage Directive compliant			
RFI/EMI	EN 55022, Class B; CE EMC Directive compliant			
Immunity	IEC 801-2, Level 4 / IEC 801-3, Level 3 / IEC 801-4, Level 4 / IEC 801-5, Level 3			

LIMITED WARRANTY

Liebert Corporation extends the following LIMITED WARRANTY to the purchaser and to its customer (collectively referred to as the "Purchaser"): the enclosed Uninterruptible Power System (UPS) and components are free from defects in materials and workmanship under normal use, service, and maintenance FOR A PERIOD OF TWO YEARS FROM THE DATE OF ORIGINAL PURCHASE from Liebert or the Liebert dealer or retailer. THE FOREGOING WARRANTY IS THE ONLY WARRANTY GIVEN AND NO OTHER WARANTY IS PROVIDED, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Certain aspects of disclaimers are not applicable to consumer products acquired by individuals and used for personal, family, or household purposes (as distinguished from industrial or other purposes). Local laws may not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary according to local law.

Certain repairs or services are the responsibility of the Purchaser and the Purchaser is expected to pay for them. This warranty does not extend either to products with removed or altered serial numbers or to any losses or damages due to act of God or source external to the product, misuse, accident, abuse, neglect, negligence, unauthorized modification, alteration, or repair, use beyond rated capacity, or improper installation, maintenance, application or use, including, without limitation, use in a manner contrary to the accompanying instructions or applicable codes. WARNING: Warranty is void if the battery is allowed to discharge below the minimum battery cutoff point. To prevent such discharge DO NOT leave the unit power switch "ON" for more than two (2) days without AC power being supplied to the UPS. The battery must be recharged every four (4) to six (6) months when not in use.

If the UPS fails to conform with the above warranty within the two year warranty period, Liebert will repair or replace the UPS, at Liebert's option. Repairs or replacements are warranted for the remainder of the original warranty period. Purchaser, to make a warranty claim, should call +44 (0)1793 553355 to obtain a Returned Goods Authorization number and shipping instructions. Return transportation costs to Liebert are the responsibility of the Purchaser.

"LIFE SUPPORT" POLICY

This product is not recommended, and the Company will not knowingly sell this product, for use with life support and other designated "critical" devices. ANY SUCH USE BY A USER AUTOMATICALLY VOIDS AND DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND EXPRESS WARRANTIES THAT THIS PRODUCT WILL CONFORM TO ANY AFFIRMATION OR PROMISE, FOR THIS PRODUCT AND THE USER AGREES THAT IN NO EVENT SHALL THE COMPANY BE LIABLE FOR CONSEOUENTIAL OR INDIRECT DAMAGES.

Liebert®

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PowerSure™ Interactive

700-2200 VA
230 V

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Worldwide FAX Tech Support.....614-841-5471

The Company Behind The Products

With more than 500,000 installations around the globe, Liebert is the world leader in computer protection systems. Since its founding in 1965, Liebert has developed a complete range of support and protection systems for sensitive electronics:

- Environmental systems: close-control air conditioning from 1.5 to 60 tons.
- Power conditioning and UPS with power ranges from 250 VA to more than 1000 kVA.
- Integrated systems that provide both environmental and power protection in a single, flexible package.
- Monitoring and control — on-site or remote — from systems of any size or location
- Service and support, through more than 100 service centers around the world, and a 24-hour Customer Response Center.

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SLI-23550 (2/98) Rev. 5.0